What Is Claimed Is:

1. A method for effecting a computer-aided estimation of the mass of a vehicle, particularly of a commercial vehicle, based on the equilibrium relationship between motive force F and the sum of the inertial force and the drive resistances, in which the mass m and a gradient angle α of the roadway are contained as quantities, characterized by the following steps:

a) computer-aided differentiation of the equilibrium relationship with respect to time, assuming that the gradient angle α is constant;

b) calculating the mass m of the vehicle and/or the reciprocal value 1/m from the equilibrium relationship differentiated with respect to time.

2. The method as recited in Claim 1, wherein the drive resistances are formed by the sum of an accelerative force or deceleration force as a function of the mass m, and an uphill or downhill force as a function of the gradient angle α of the roadway.

3. The method as recited in Claim 2, wherein the mass m is calculated from the equation $m = \frac{dF/dt}{da/dt}$, where a is the time derivation of the longitudinal vehicle velocity and F is the motive force of the vehicle.

4. The method as recited in Claim 3, wherein the motive force F and the acceleration or deceleration a are determined from measured quantities.

5. The method as recited in Claim 4, wherein the measured quantities are available in a control unit of the vehicle.

6. The method as recited in Claim 5, wherein the measured quantities are filtered as a function of the signal quality.

7. The method as recited in one of Claims 4 through 6, wherein the measured quantities are measured repeatedly, and the measurements are weighted differently.

8. The method as recited in one of the preceding claims, wherein the computer-aided differentiation of the equilibrium relationship is carried out continuously and using recursive methods.

9. The method as recited in Claim 8, wherein the computer-aided differentiation of the equilibrium relationship is carried out according to the two-point differentiation or using a state-variable filter.

10. The method as recited in one of the preceding claims, wherein both the mass m and the reciprocal mass 1/m are calculated, and a weighted average value is formed.

11. A device for effecting a computer-aided estimation of the mass of a vehicle, particularly of a commercial vehicle, including a calculating unit for calculating the mass m of the vehicle and/or the reciprocal value of the mass m from the equilibrium relationship between the motive force F and the sum of the inertial force and the drive resistances, into which the mass m and a gradient angle α of the roadway are entered as calculation quantities, after a computer-aided differentiation of the equilibrium relationship with

respect to time, assuming the gradient angle α is constant.

12 The device as recited in Claim 11, wherein the calculating unit is integrated into a control unit of the vehicle.